ASSOCIATION BETWEEN THYROID HORMONE LEVELS AND POLIBROMODIPHENYL ETHER CONCENTRATIONS IN PREGNANT WOMEN FROM VALENCIA, SPAIN

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Background and Aims: Some studies have suggested that polybromodiphenyl ethers (PBDEs) may alter thyroid function during critical periods of thyroid hormone-dependent brain development. The aim of the present study was to investigate the association between maternal concentrations of PBDEs and thyroid hormone status during the first trimester of pregnancy.
Methods: The study sample (n=159) was drawn from a prospective mother-infant cohort established in Valencia as part of the INMA (Environment and Childhood) project. Thyroid-stimulating hormone (TSH), total triiodothyronine (TT3) and free thyroxine (FT4) were measured as biomarkers of thyroid function in maternal serum samples at 12 weeks of pregnancy. PBDE concentrations (PBDE 47, 99, 153, 154, 209) were measured by gas chromatography (GC) coupled to a mass spectrometer (MS) operating in negative ionization mode (NICI). Association among maternal PBDE serum concentrations and thyroid hormone levels were assessed using multivariate linear regression analyses adjusting for potential confounders.
Results: Serum TT3, FT4, and TSH concentrations ranged from 1.5 to 4.1 nmol/L, 8.1 to 16.4 pmol/L and 0.05 to 9.3 µU/mL respectively. Median of total PBDEs was 7.6 ng/g lipid (range between not detected and 87.4 ng/g lipid). A significant positive association was found between total PBDEs and TSH (β=0.30; 95% CI=0.07-0.53) after adjustment for confounders. FT4 tended to be lower in mothers with higher PBDE concentrations but the trend was not statistically significant. No association was found between PBDEs and TT3.
Conclusions: PBDE concentrations in maternal serum were positively associated with increases in maternal TSH levels. Concentrations of FT4 were negatively, but not statistically significant, associated to PBDE concentrations. TT3 levels did not seem to be influenced by exposure to PBDEs. These findings suggest that PBDEs may interfere with the thyroid system of pregnant women.